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PINE BEETLE SURVEY OF 1946

on the

WHITMAN NATIONAL FOREST

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#### Introduction

Systematic surveys of the forest insect situation in the ponderosa pine stands within and adjacent to the Whitman National Forest were begun in 1935 and conducted annually until 1943. Due to war conditions no survey was conducted on the forest during 1944 and 1945. The survey program, a cooperative undertaking by the Forest Service and the Bureau of Entomology and Plant Quarantine, was reactivated in 1946. Both intensive and extensive methods were utilized in carrying on the 1946 survey. The intensive phase consisted of a 100 percent cruise of all insect-caused losses on six 320-acre check plots. These plots were cruised during the period August 5 - 16 by a Forest Service crew consisting of Messrs. Fred Heiter, Donald C. Wheat, and Gould J. Hoyt, crew leader. The extensive phase of the survey consisted of an observational reconnaissance of all forest types. The stands were viewed from roads, trails, lookouts and other points of vantage. This part of the survey was carried on by the writer who also supervised the crew.

#### Past Losses

Aided by the cumulative effects of drought conditions which greatly lowered the resistance of the pine stands, a quiescent infestation of the western pine beetle began building up during 1930 and quickly assumed epidemic proportions on many parts of the forest. The epidemic, which reached its greatest intensity during 1932, was halted during the winter of 1932-33 by extreme sub-zero temperatures that caused widespread mortality to overwintering broods of the western pine beetle. This mortality coupled with an improvement in tree growth aided in reducing beetle losses to a low point during the next few years. A flare-up occurred during 1938 but infestation declined again during 1939. Some increase occurred in 1941.

#### Recent Losses on Plots

Losses accumulating on the plots since they were last cruised in 1943 were marked and recorded during the survey of 1946, but no attempt was made to identify the 1943-1945 losses by years, as it is difficult to determine the year of a tree's death once the bark beetles have emerged. This lumping of data interrupted the continuity of the record of infestation trends on the plots. However, unbroken records

of plots on forests adjacent to the Whitman indicate that the infestation declined to an all-time low during 1943 but increased sharply during 1944 and 1945. The partial data for 1946 indicate that the infestation either remained static or declined to some extent. Data for the Whitman plots are presented in Table 1.

#### Current Pine Beetle Situation

Fairly good conditions were found to prevail in the ponderosa pine stands over the forest as a whole. At the higher elevations the pine beetle infestation remained more or less endemic. At lower elevations, especially in the fringe and high hazard stands, the infestation was somewhat above normal and in these localities approached light epidemic proportions.

The most aggressive infestation was found in the stands of the East Camp Creek drainage, especially along King Creek where the pines have been seriously weakened by a needle fungus, Elytroderma deformans (Darker). During the past two seasons losses on this area increased from 10 to 12 per section to 75 to 100 trees per section.

The largest center was found in the stands around the west end of Burnt River Valley extending from Pels Gulch north some nine miles to Sheep Creek. The third center is in stands north of Sumpter Valley, especially on the area extending from Deer Creek to Union Creek.

From information secured on the survey, it is estimated that some eight million board feet of ponderosa pine were killed by insects during 1945 in the virgin pine stands of the forest. A breakdown of these losses by areas and units is given in Table 2. The virgin stand acreage was computed from records of cutting furnished by the Forest Service.

#### Other Insects

During the past three years the Douglas fir beetle (Dendroctonus pseudotsugae Hopk.) and the flatheaded fir borer (Melanophila drymocis (Kirby)) caused heavy losses in stands of mature Douglas-fir. In many places groups of 8 to 10 dead trees were found. Losses were especially severe on portions of the Minam Division of the forest. It appears that the epidemic reached its peak in 1945 and is now declining.

Considerable loss also occurred in the stands of true fir. This loss was largely caused by the fir engraver beetle (Scolytus ventralis Lec.) assisted by the flatheaded fir borer (Melanophila drymocis (Kirby)) and the roundheaded fir borer (Tetropium abietis Fall.). This infestation also appears to be on the wane.

An outbreak of the spruce budworm (Archips fumiferana (Clem.)) apparently has been in progress on the Dale District for several years. It has now spread over the entire area between the middle fork of the John Day

and Desolation Creek. White fir and Douglas-fir are the preferred hosts, but some feeding also occurred on Engelmann spruce and lodgepole pine. In many localities, especially in canyons, the mature trees were heavily defoliated and the understory completely stripped. Undoubtedly considerable mortality will occur where defoliation has been severe. Damage to the understory is shown in Figure 1.

#### Other Phenomena

Early in 1946, foliage of ponderosa pine on many portions of the Blue Mountain region began to turn yellow and later brown. The cause of this damage was not immediately determined. Specimens of injured needles collected on the Umatilla Forest were taken to the office of Forest Pathology where the damage was tentatively identified as winter injury, since there was no evidence of fungus activity. Specimens of similar injury were collected early in August from various points of the Whitman Forest by Mr. A. J. Jaenicks of the Regional Office. These specimens were identified by the forest pathologists as being infected by Elytroderma deformans (Barker), a needle-killing fungus that is characteristically hard to detect in the early season. This fungus is reported capable of killing ponderosa pine reproduction and seriously weakening mature trees. Indications are that it has been causing damage for a number of years on certain portions of the Whitman forest.

The largest area and most serious damage is in the East Camp Creek drainage, especially along King Creek. A range rider is reported to have noted a small area of fading trees on the upper portion of King Creek about three years ago. Presumably these trees were affected by Elytroderma. Now the infection extends two or more miles up and down the canyon. The repeated killing of foliage has left much reproduction and a high percentage of the mature trees in a dying condition. Until recently, a low endemic infestation of the western pine beetle was the rule in this area. However, the beetles were quick to take advantage of the excellent host material provided by the fungus-weakened trees. The low endemic infestation increased, quickly assuming aggressive tendencies. By late August a light epidemic infestation was in progress.

Taking cognizance of this serious situation, the Forest Service is making a timber sale in this area. The specific purpose of this sale is to remove all beetle-infested and seriously weakened trees from the stand. This prompt action should alleviate the threat of a serious beetle epidemic developing in this area.

Another serious situation exists in the selectively logged stands on Chicken Creek. There the residual stand consists largely of Keen Class 1, 2, and young 3 trees - trees that are normally resistant to bark beetles. Many of these trees, which are in a bad way from repeated onslaughts of the needle fungus, are now being attacked and finished off by bark beetles. This combination of disease and insects is causing considerable loss on this area.

Considerable infection by Elytroderma is also present in the stands on Wind Creek north of Sumpter, Oregon. While many of the trees are seriously affected, little or no mortality has yet occurred. It was from Sumpter that this fungus was first reported about 1916.

Some damage is also occurring in the younger stands, mostly reproduction and poles, on the cutover area up Velvet Creek east of Medical Springs, Oregon. A group of reproduction infected by this fungus is shown in Figure 2.

#### Recommendations

No conditions warranting direct control measures were found to exist on the forest during 1946.

For many years above-normal beetle loss has persisted in stands around the west end of the Burnt River Valley. The predominance of high hazard trees in these stands indicate that above-normal losses can be expected to continue. Unless this stand is to be harvested in the very near future, a program of sanitation-salvage logging would seem in order to salvage timber values which would otherwise be lost and to provide protection against excessive losses until such time as a utilization cut is undertaken.

The destructive record of the spruce budworm in forests of the eastern United States warrant keeping the infestation of this insect on the Whitman Forest under close surveillance.

A close watch should also be kept on bark beetle activity in centers of fungus injury, as an epidemic could quickly develop in these seriously weakened stands. Any signs of beetle aggressiveness should be promptly dealt with by removing all weakened trees.

Table 1. Ponderosa pine killed by bark beetles on virgin check plots - Whitman National Forest and adjacent private lands

Area & Plot	Plot Description					Combined Losses 1943 - 1945						
	T	R	Sec.	Pine Timber	Pine Vol. B.M.	No. Trees	Average Per Year		Ratio to 1942			
							Total Volume B.M.	Per Acre				
<u>Dale</u>												
Sig Spring	85	32E	8 5 $\frac{1}{2}$	320	2,483,960	19	15,290	5,090	17	.21	.55	
<u>John Day</u>												
Susanville	105	33E	17 N $\frac{1}{2}$	320	2,412,870	25	21,420	7,140	22	.29	.87	
<u>Wapato</u>												
Exp. Sta.	125	36E	3 N $\frac{1}{2}$	320	3,398,210	68	39,890	13,300	41	.39	.50	
Smith Cr.	95	33E	34 S $\frac{1}{2}$	317	2,059,540	84	41,090	13,700	43	.67	.97	
Auburn Cr.	125	40 $\frac{1}{2}$	3 N $\frac{1}{2}$	320	2,134,200	47	41,220	13,740	43	.65	2.12	
Area Total				957	7,591,950	201	122,200	40,740	43	.54	.86	
<u>Ponder River</u>												
Sparta	85	44E	5 S $\frac{1}{2}$	320	1,675,280	30	17,650	5,880	18	.35	.82	
Forest Total 6 Plots				1,917	13,894,060	284	176,560	850	31	.43	.79	

Table 2. Estimate of insect-caused ponderosa pine losses on the Whitman National Forest

Area & Unit	PINE TYPE		Total Acreage	ESTIMATE OF 1945 LOSS			
	Virgin Acreage	Cutover Acreage		No. of Trees	Volume M.B.M.	Trees per Section	B. M. per Acre
<u>Dale</u>							
Dale	81,400	8,200	89,600	2,040	1,350	16	17
North Fork	40,720	—	40,720	756	510	12	13
Granite	15,720	80	19,500	124	70	4	4
Area Total	141,840	8,280	150,120	2,920	1,930	13	14
<u>John Day</u>							
Susanville	49,480	23,970	73,450	1,390	840	18	17
Austin	27,000	41,000	68,000	250	140	6	5
Prairie City	55,700	10,090	65,790	2,600	1,690	20	20
Area Total	132,180	75,060	207,240	4,240	2,670	20	20
<u>La Grande</u>							
Starkey	13,390	47,610	61,000	210	120	10	9
<u>Sumpter</u>							
North Powder	—	18,030	18,030	—	—	—	—
Pacahondas	4,010	11,290	15,300	60	30	10	7
Sumpter	9,280	43,220	52,500	556	280	38	30
Whitney	7,310	30,170	37,480	160	100	14	14
Burnt River	28,780	11,320	40,100	2,320	1,560	52	54
Bridgeport	21,140	33,210	55,350	1,020	660	30	30
Unity	7,140	17,100	24,240	385	250	25	25
Area Total	78,660	164,340	243,000	4,501	2,880	37	37
<u>Grande Ronde</u>							
Mt. Harris	—	17,560	17,560	—	—	—	—
Minam River	4,480	—	4,480	60	30	9	7
Union	—	28,720	28,720	—	—	—	—
Area Total	4,480	46,280	50,760	—	—	—	—
<u>Powder River</u>							
Eagle Creek	14,500	54,510	69,010	385	250	17	17
Pine Creek	17,400	11,670	29,070	250	150	9	9
Lookout Mtn.	—	1,920	1,920	—	—	—	—
Area Total	31,900	68,100	100,000	635	400	13	13
Forest Total	402,450	409,670	812,120	12,566	8,030	20	20



FIGURE 1  
Damage to the Douglas fir and white  
fir understory by Archips fumiferana (Clem.).

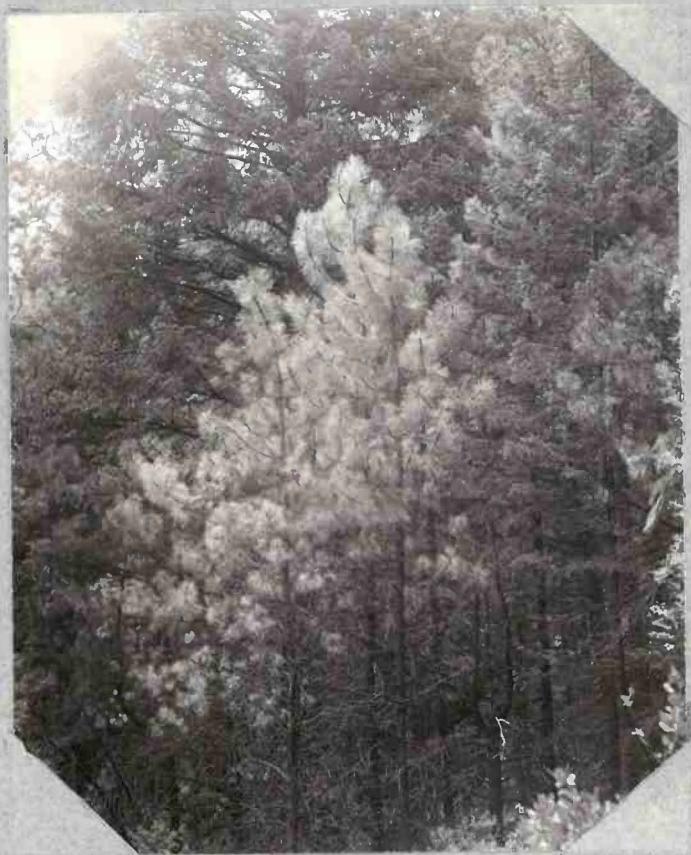


FIGURE 2  
Ponderosa pine reproduction infected  
by Elytroderma deformans (Darker)